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## Monterey, California



# THESIS

USING COST REALISM TO IMPROVE THE  
SOURCE SELECTION PROCESS

by

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December 1987

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The study concludes that cost realism provides useful assistance in making the source selection decision.



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Using Cost Realism to Improve the  
Source Selection Process

by

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## ABSTRACT

The source selection decision in a competitively negotiated acquisition is very difficult. Cost realism is one evaluation factor that may be used to assist in making the source selection decision. In this study the concept of cost realism and feasible methodologies for achieving it are investigated. The role of cost realism in the source selection plan and the source selection process is identified and defined. Specific cost realism issues are reviewed and discussed. Cost realism utilization in the Department of the Navy is investigated. The study concludes that cost realism provides useful assistance in making the source selection decision.

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## 1. INTRODUCTION

### A. GENERAL

The source selection decision in a competitively negotiated acquisition that will result in award of a cost reimbursable contract is very difficult. The contracting officer or designated source selection authority must:

...ensure selection of the source whose proposal has the highest degree of realism and whose performance is expected to best meet stated government requirements.  
[Ref. 1:p. 15-19]

The selection of the proposal with the highest degree of realism and performance is judgemental on the part of the contracting officer or source selection authority. The selection is based on a careful evaluation of the factors that make up the proposal. Additionally, the Federal Acquisition Regulation (FAR) identifies other evaluation factors that may be considered which include cost realism, technical excellence, management capability, personnel qualifications, experience, past performance, schedule and other relevant factors.

In procuring products or services, the preferred method is to issue an Invitation for Bid (IFB) that completely identifies the product or service desired. A Firm Fixed Price (FFP) contract award is then made to the offeror of the bid that offers the lowest cost. This method of

procurement works best for products and services for which performance and/or design specifications are firm and more than one supplier is willing and capable of providing the product or service. When design or performance specifications are not firm, as in the case of research and development or engineering services procurements, there is a high degree of performance, schedule and cost risk.

To compensate for these risks in a fixed price contract environment, the contractor will include costs for additional labor, material, overhead and profit. If the additional cost items are not utilized during contract performance, the contractor keeps the additional costs as increased profit. If the contractor is unable to deliver the required product or services within the contract price, the contractor will suffer a loss that may be severe enough to force the contractor to default on the contract. Both of these situations, excess profit or termination for default, are considered unacceptable to the government.

For procurements with risk levels that are considered unacceptable for fixed price contracts, the government assumes the risk by awarding a cost reimbursable contract. This type of contract requires the government to reimburse all of the contractor's allowable and allocable costs incurred during contract performance. Choosing a contract source for a cost reimbursable contract award is not as simple and easy as for a fixed price contract award. To



make a contract award in this situation based entirely upon the lowest proposed cost would be unrealistic, since the final cost of performance may bear no resemblance to the original proposed cost. Additionally, the award of a cost reimbursable contract obligates the government to reimburse the contractor's allowable and allocable costs. Large increases in cost during a contract's performance seriously undermine both the Congress' and public's faith in the Navy and significantly impairs the Navy's planning, programming and budgeting system. The use of cost realism as an evaluation factor in the source selection process could provide some degree of assurance that proposed costs are realistic and defensible.

#### B. OBJECTIVE OF THE RESEARCH

The objective of this study is to explore how the source selection process evaluates contractor proposals for cost realism and how it utilizes this evaluation in source selection.

#### C. RESEARCH QUESTIONS

To achieve the objective of the research the following question was posed:

Can the cost realism concept be used to improve the source selection process?

To answer the basic research question, the following subsidiary questions were asked:

1. What is cost realism?

2. At what points and under what circumstances may cost realism become an issue in the source selection process?
3. How can cost realism best be utilized in the source selection process?

#### D. RESEARCH METHODOLOGY

The information presented in this research was obtained from currently available procurement related literature and personal interviews with contracting officers and program management office personnel. Literature was obtained from the Naval Postgraduate School Library, Defense Technical Information Center, and Defense Logistics Studies Information Exchange. Applicable regulations, directives, and instructions that govern the acquisition process were utilized. Personnel interviewed during the research effort are identified in the List of References.

#### E. SCOPE AND LIMITATIONS

This research is limited to cost realism issues and policies associated with major weapons systems acquisitions in the Department of the Navy (DoN). The thrust of the research was on developing an understanding of the cost realism issues present in the source selection process and how these issues are recognized and dealt with by the contracting officer, Source Selection Evaluation Board (SSEB), Source Selection Advisory Council (SSAC), and Source Selection Authority (SSA).

## F. ORGANIZATION OF THE STUDY

This thesis is organized to provide the reader with an examination of the cost realism concept and a basic understanding of its role in the source selection decision. The thesis is divided into the following chapters:

1. Chapter II introduces the concept of cost realism through a discussion of the source selection environment and the source selection process leading up to the definition of cost realism.

2. Chapter III reviews and discusses where and when cost realism issues are specifically addressed during the source selection process.

3. Chapter IV discusses how cost realism is utilized in the Department of the Navy.

4. Chapter V summarizes the results of the research, provides conclusions and recommendations developed as a result of this study and provides recommendations for further study.

## II. THE COST REALISM CONCEPT IN PERSPECTIVE

### A. INTRODUCTION

This chapter examines the concept of cost realism and brings it into perspective. The framework for investigation of cost realism is initiated by a discussion of the source selection environment and the source selection process. Next, the roles of cost and price in the source selection process are discussed. Finally, the cost realism concept is defined, and considerations are presented to demonstrate its position and role within the overall process.

### B. THE SOURCE SELECTION ENVIRONMENT

Major weapon systems are acquired by the Department of the Navy to provide hardware resources to operational forces enabling them to achieve operational objectives in their support of national policies and objectives.

Major weapons systems are developed to fulfill a mission need. Mission need could be the result of advances in technology that render a current weapon system obsolete or advancement of enemy capabilities beyond current defensive capabilities. No matter what the reason for development of a major weapon system, several similarities are present in almost all new major weapon systems



acquisitions. First, the weapon system begins as a concept that utilizes the latest in technological advances and in some cases, utilizes technology that is still under development. Second, successful research, development, test and evaluation (RDT&E) of a technologically advanced major weapon system can involve many unknown factors and their attendant risks. Third, the government must carry most, if not all, of the cost risk associated with major weapon system development through the award of a cost reimbursable contract.

The cost of a major weapon system is often measured in hundreds of millions or billions of dollars. When there is more than one source available to develop and manufacture the major weapon system, the resulting competition may be fierce and highly competitive. There is usually much more at stake than the profit and loss statement of a single contractor. Thousands of jobs could be at risk, not only with the primary contractor, but with sub-contractors and other "trickle-down economy" business in the surrounding communities. Additionally, local governments, special interest groups and congressional interests are always aroused whenever a government action has the potential for major impact on the economy, environment or votes.

There is a large amount of pressure involved in the acquisition of a major weapon system. There is pressure on the program manager to develop an affordable, reliable and

technologically advanced system on time and under budget. There is pressure on the contractors to win the system award competition and keep profits and jobs secure. There is pressure on the contracting officer or source selection authority to procure the system from responsible sources at fair and reasonable prices calculated to result in the lowest ultimate cost to the government.

The very real result of this pressure, when coupled with the technical, schedule and cost risks involved, could be the award and development of a major weapon system based on an unrealistic proposal.

#### C. THE SOURCE SELECTION PROCESS

Source selection is the process wherein the requirements, facts, recommendations and government policies relevant to an award decision in a competitive procurement of a system are examined, and the source selection decision is made. Source selection procedures are designed to:

- (a) maximize competition
  - (b) minimize the complexity of the solicitation, evaluation, and the selection decision
  - (c) ensure impartial and comprehensive evaluation of offerors' proposals and
  - (d) ensure selection of the source whose proposal has the highest degree of realism and whose performance is expected to best meet stated Government requirements.
- [Ref. 1:p. 15-19]

These procedures are not only good business, but are also in keeping with the responsibilities inherent within the stewardship of public monies and trust.

The determination of those factors and attributes which identify a responsible source, as well as how a fair and reasonable price can be accurately calculated, has been, and remains today, a difficult problem for DoD to resolve. Deputy Secretary of Defense Carlucci recognized this problem when he reported that:

Some DoD competitively-selected contractors have performed poorly. In some instances, source selection criteria do not sufficiently take into account past performance or plans for future phases of a program. Also, the credibility and realism of contractor cost proposals are not always challenged. [Ref. 2:p. 38]

Failures in the DoD source selection process can easily result in unanticipated program cost growth which can then lead to budgetary shortfalls or schedule slippage due to inadequate funding. Additionally, when it becomes necessary to fix the blame, which it almost invariably does, the resultant finger pointing, accusations, counter-accusations, congressional hearings, Inspector General and General Accounting Office investigations and audits can result in either program redirection, reduction or cancellation. There is also the very real possibility for additional statutory or regulatory guidance being added to the already overwhelming and overburdened acquisition system.

The Department of Defense recognized the problems associated with inadequate source selection decisions when

it issued Department of Defense Directive (DODD) 4105.62, Selection of Contractual Sources for Major Defense Systems, establishing detailed guidelines for the management of the source selection process.

As part of the policy which governs the solicitation, evaluation and source selection process, DODD 4105.62 states:

1. The prime objectives of the process are to (a) select the source whose proposal has the highest degree of realism and credibility and whose performance is expected to best meet Government objectives at an affordable cost; (b) assure impartial, equitable, and comprehensive evaluation of competitors' proposals and related capabilities; and (c) maximize efficiency and minimize complexity of solicitation, evaluation and the selection decision.

2. Each DoD component shall develop, and consistently apply, procedures which create the environment for an impartial, balanced and realistic appraisal of all proposals submitted.

The prime objectives of the source selection process are therefore in keeping with Defense Acquisition Regulations (DAR) policy to procure from responsible sources at fair and reasonable prices.

The source selection process as currently established requires an evaluation of the contractor's proposal and the capability of the contractor to successfully accomplish the program under consideration.

The primary goal of evaluation is to determine, for each competitor, the most likely outcome in terms of system characteristics, costs (development, production, and support), and schedules....The evaluation should give consideration to each industrial competitor's assessment of the technical and financial risks involved and the credibility of proposed approaches to eliminate, avoid or minimize those risks.... [Ref. 3:p. 6]



This evaluation process is conducted in four steps:

Step 1. Separate technical proposals shall be solicited and evaluated....

Step 2. A cost/price proposal shall then be obtained...together with any necessary revisions to correct deficiencies in the technical proposals...the competitive range will be established...meaningful discussions will be held with the remaining offerors....

Step 3. Following such discussions, a common cutoff date for the receipt of final revisions to technical and cost/price submittals will be established...after receipt of any revised submittals, the proposals shall be evaluated based upon the offeror's total proposal and a contractor selected for negotiation of the contract.

Step 4. A definitive contract will then be negotiated with the selected offeror. [Ref. 3:p. 7]

#### D. THE ROLES OF COST AND PRICE IN THE SOURCE SELECTION PROCESS

##### 1. Definitions

In the source selection process, the determination of estimates for cost and price for a weapon system may become a point where the government and contractor take divergent courses. It becomes necessary, therefore, to define the terms frequently used in developing the estimates for cost and price:

- a. "Cost Analysis" is the review and evaluation of the separate cost elements and proposed profit of (a) an offeror's or contractor's cost or pricing data and (b) the judgmental factors applied in projecting from the data to the estimated costs, in order to form an opinion on the degree to which the proposed costs represent what the contract should cost, assuming reasonable economy and efficiency. [Ref. 1:p. 15-25]
- b. "Cost or Pricing data" means all facts as of the time of price agreement that prudent buyers and sellers would reasonably expect to affect price negotiations

significantly. Cost or Pricing data are factual, not judgmental, and are therefore verifiable. While they do not indicate the accuracy of the prospective contractor's judgment about estimated future costs or projections, they do include the data forming the basis for that judgment. Cost or Pricing data are more than historical accounting data; they are all the facts that can be reasonably expected to contribute to the soundness of estimates of future costs and to the validity of determinations of costs already incurred. They also include such factors as (a) vendor quotations; (b) nonrecurring costs; (c) information on changes in production methods and in production or purchasing volume; (d) data supporting projections of business prospects and objectives and related operations costs; (e) unit-cost trends such as those associated with labor efficiency; (f) make-or-buy decisions; (g) estimated resources to attain business goals; and (h) information on management decisions that could have a significant bearing on costs. [Ref. 1:p. 15-25]

- c. "Price" is the cost plus any fee or profit applicable to the contract type. [Ref. 1:p. 15-26]
- d. "Price Analysis" is the process of examining and evaluating a proposed price without evaluating its separate cost elements and proposed profit. [Ref. 1: p. 15-26]
- e. "Should-Cost Analysis" is a specialized form of cost analysis employing an integrated team of government contracting, contract administration, pricing, audit, and engineering representatives. It differs from regular cost analysis in its depth, in the fact that it is conducted at the contractor's plant, and in the extent to which the Government identifies and challenges inefficiencies in the contractor's management and operations rather than merely challenging certain proposed costs. The purpose of should-cost analysis is to (1) identify uneconomical or inefficient practices in the contractor's management and operations, (2) quantify their impact on cost in order to develop a realistic price objective for negotiation, and (3) lead to both short and long-range improvements in the contractor's economy and efficiency. [Ref. 1:p. 15-39]
- d. "Proposal Evaluation" is an assessment of both the proposal and the offeror's ability (as conveyed by the proposal) to successfully accomplish the prospective contract. [Ref. 1:p. 15-21]

## 2. The Roles

Before a weapon system can reach the source selection stage, the estimated cost of the weapon system has played a key role in the planning, programming and budgeting process. There is the strong possibility that Congressional authorization and appropriation for the weapon system was based on the estimated cost as much as it was based on the need for the systems' capabilities.

The program manager must ensure that only realistic cost and budget information is provided and that such information is accurate and complete. Cost estimates must include the full anticipated development, production and operational costs associated with the program, even though this task is especially difficult at program initiation. The estimates support budgeting and early funding for testing, budgeting for most likely costs, budgeting for technical and scheduling risks, capitalization of production and specialized operational facilities and independent cost analysis. [Ref. 4:p. 1-9]

FAR requires price or cost to the government be included as an evaluation factor in every source selection. Other evaluation factors previously identified that may apply to a particular acquisition are cost realism, technical excellence, management capability, personnel qualifications, experience, past performance,

schedule and other relevant factors. The estimated cost of the contractor's proposal will certainly be a factor in the evaluation process. Cost is a driving factor throughout the system acquisition process, but it must be put in perspective.

In the development stage, the prime concern is to find and engage contractors who have the conceptual ideas, manpower, management expertise, facilities, and the demonstrated experience to develop a system capable of meeting the mission need. Cost estimates in the earlier stages of the acquisition process are far from precise, and independent estimates of development and Life Cycle Costs (LCC) by an inhouse activity are needed to establish a baseline against which to evaluate the validity of contractor cost estimates. With due regard for its significance, cost is a controllable element which can be managed through carefully drawn, properly executed contracts and through liberal use of competition throughout the acquisition process. The cost to develop a system is only one part, albeit an important one, of the system LCC. Costs incurred in development can return large dividends in the form of lower production and maintenance costs as well as in improved performance. [Ref. 4:p. 4-40]

While the lowest price or lowest total cost to the government is properly the deciding factor in many source selections, in certain acquisitions the government may select the source whose proposal offers the greatest value to the government in terms of performance and other factors.

In awarding a cost-reimbursement contract, the cost proposal should not be controlling, since advance estimates of cost may not be valid indicators for final actual costs. There is no requirement that cost-reimbursement contracts be awarded on the basis of lowest proposed cost, lowest proposed fee or the lowest total proposed cost plus fee. The award of cost-reimbursement contracts primarily on the basis of estimated costs may encourage the submission of



unrealistically low estimates and increase the likelihood of cost overruns. [Ref. 1:p. 15-20]

## E. THE COST REALISM CONCEPT

### 1. General

Cost is a key factor in the source selection process. It may not be the most important factor, but its importance cannot be overlooked. The determination of a weapon systems' estimated cost through cost analysis is a judgemental decision. The decision may be influenced by optimism or pessimism toward any one or more of the factors which go into making up the total estimated cost. Traditionally, contractors have the tendency to lean toward optimism in cost estimation and the government has the tendency to lean toward pessimism. However, this is not always the rule, and situations do occur where the opposite may happen. Therefore, the methodology by which a contractor's cost proposal is evaluated to determine whether it is reasonable, realistic, credible and defensible becomes an important issue.

### 2. Cost Realism Defined

Cost realism may be defined as the methodology by which a contractor's cost proposal is evaluated during the source selection process to determine with some degree of accuracy and fairness whether or not it is a realistic estimate of what the actual costs are expected to be,

assuming no change in the government's requirements or the contractor's technical approach.

### 3. Considerations

FAR requires price or cost be included as an evaluation factor in every source selection, but an optional cost realism evaluation may be made at the discretion of agency acquisition officials. There is no definitive guidance in statutes or regulations for the conduct of a cost realism evaluation; however, there are a variety of cost analysis elements and techniques that may be used to determine the realism of proposed costs. When cost realism is included as an evaluation factor, the informed judgement rule requires the contracting officer or source selection authority make an analysis of proposed costs sufficient to make a supportable judgment that the costs proposed are realistic.

### F. SUMMARY

This chapter provided a broad overview of the source selection environment and process for major weapon system acquisition. The complexity and cost of a major weapon system and the resultant economic impact on competition winners and losers makes the source selection decision very important.

The evaluation of a proposal to determine its degree of realism requires a thorough analysis of every element which makes up the proposal. Cost is a required evaluation



factor and may become the controlling factor; therefore, a determination of the realism of proposed costs becomes a required evaluation factor.

By this analogy, an evaluation of cost realism becomes required; however, its methodology is not defined in statute or regulation. This chapter presented a definition of cost realism as an evaluation factor in the source selection decision process.

### III. COST REALISM ISSUES DURING SOURCE SELECTION

#### A. INTRODUCTION

It is the purpose of this chapter to review and discuss where and when cost realism issues are specifically addressed during the source selection process. For purposes of discussion, the chapter divides the source selection process into three parts. Part 1 encompasses all steps leading up to the release of the solicitation. Part 2 covers proposal evaluation. Part 3 addresses the source selection decision. Additionally, this chapter briefly addresses the issue of cost realism based protests.

#### B. PLANNING FOR COST REALISM

##### 1. The Source Selection Plan Groundwork

When an acquisition objective has been established, an acquisition plan is prepared that addresses the acquisition process which will be followed to achieve the desired objective.

A key part of the acquisition planning process is the source selection plan. The source selection plan, as a minimum, includes:

- (1) A description of the organization structure
- (2) Proposed presolicitation activities
- (3) A summary of the acquisition strategy
- (4) A statement of the proposed evaluation factors and their relative importance
- (5) A description of the evaluation process, methodology

and techniques to be used and  
(6) A schedule of significant milestones. [Ref. 1:p. 15-23]

## 2. The Solicitation

The solicitation is the method by which the government's requirements are conveyed to potential contractors either as a Request for Proposal (RFP) or as a Request for Quotation (RFQ).

Solicitations shall contain the information necessary to enable prospective contractors to prepare proposals....  
[Ref. 1:p. 15-10]

The solicitation is prepared using the uniform contract format which facilitates preparation of both the solicitation and the contract. The principal difference between the solicitation and the contract is the inclusion of Part IV, Representations and Instructions, in the Solicitation. Part IV contains section K, Representations, Certifications and Other Statements of Offerors or Quoters, Section L, Instructions, Conditions and Notices to Offerors or Quoters and Section M, Evaluation Factors for Award. It is in Part IV, Sections L and M, that cost realism issues are first addressed.

Section L contains:

...solicitation provisions and other information and instructions not required elsewhere to guide offerors or quoters in preparing proposals or quotations. [Ref. 1:p. 15-12]

It is in this section that detailed guidance is provided for the submission of technical and cost or pricing data. The level of detail required is that which

is considered necessary for complete technical and cost analysis of the proposal. This routinely requires submission of technical and cost data in Work Breakdown Structure (WBS) format. In this way, cost and technical comparisons can be made between different offerors for the same WBS elements, and greater cost visibility can be provided where considered necessary.

Section M, of the solicitation:

...shall clearly state the evaluation factors, including price or cost and any significant subfactors, that will be considered in making the source selection and their relative importance. Numerical weights, which may be employed in the evaluation of proposals, need not be disclosed in solicitation. [Ref. 1:p. 15-20]

However, it is necessary to:

...state the relative importance the government places on those evaluation factors and subfactors. [Ref. 1:p. 15-12]

This is performed by identifying minimum requirements that apply to particular evaluation factors and significant subfactors.

#### C. THE PROPOSAL EVALUATION

Proposal evaluation is an assessment of both the proposal and offeror's ability (as conveyed by the proposal) to successfully accomplish the prospective contract. An agency shall evaluate competitive proposals solely on the factors specified in the solicitation. [Ref. 1:p. 15-21]

The proposal evaluation factors normally specified in the solicitation are technical, cost and management capability. Other factors included for evaluation

purposes may include personnel qualifications, past performance, reliability and maintainability and schedule. For cost realism purposes, the primary evaluation factors which require careful and complete analysis are technical and cost.

#### 1. Technical Analysis

The purpose of the technical analysis is to assess the offeror's ability to accomplish the minimum technical requirements. The analysis looks at the types and quantities of labor proposed, bills of material, proposed sub-contracts, proposed technical approach, assumptions of technical risk and other pertinent technical elements. Based on the results of the technical analysis, a summary, matrix or quantitative ranking of each technical proposal can be made as specified in the source selection plan.

#### 2. Cost Analysis

Methodologies for conducting cost analysis may differ depending upon what is being procured and who is conducting the cost analysis. However, the basic goal of cost analysis remains the formation of:

..an opinion on the degree to which the proposed costs represent what the contract should cost, assuming reasonable economy and efficiency. [Ref. 1:p. 15-25]

The government's opinion on costs usually takes the form of a government estimate of the most likely cost which will be incurred by the offeror in fulfilling the terms and conditions of the contract.



### 3. Overall Analysis

While conducting technical and cost analyses, questions invariably arise with regard to the technical or cost elements being proposed. These questions are provided to the offeror who responds with the necessary substantiating documentation. The government must exercise great care in pre-award discussions with offerors to avoid providing technical or cost information about competing proposals or appearing to direct technical or cost changes in the proposal. Overt technical and cost leveling is a prohibited practice, but pre-award discussions frequently have the effect of seeing differing proposals move closer together in certain technical or cost areas. This can have the effect of bringing the higher weighted technical scores of competent offerors closer together and cause the lower weighted cost score to become more important than originally intended.

### 4. Cost Realism Scoring

After the technical and cost analysis have been completed, the proposal is evaluated and scored for cost realism in accordance with the cost realism scoring plan established as a part of the source selection plan. There are differing methods for scoring cost realism, with no one method being clearly superior. The one similarity all methods seem to share is their use of the government cost



estimate developed during cost analysis as the baseline against which the proposal is evaluated and scored.

#### D. SOURCE SELECTION

The source selection decision is made by the source selection authority using the evaluation process, methodology and techniques established in the source selection plan.

The Source Selection Authority shall consider any rankings and ratings, and, if requested, any recommendations prepared by evaluation and advisory groups. [Ref. 1:p. 15-23]

In practice, the evaluation of a proposal is normally performed by the Source Selection Evaluation Board (SSEB) in accordance with the evaluation factors and process established in the solicitation and source selection plan. It is the SSEB that evaluates and scores proposals for cost realism.

The results of the proposal evaluations by the SSEB are then provided to the Source Selection Advisory Council (SSAC) for review. The SSAC will review the evaluation efforts of the SSEB and request clarification or further evaluation as required. When all evaluations have been satisfactorily completed, the SSAC will compare the evaluation results between the competing proposals. When the SSAC is finished comparing evaluation results, a recommendation of a source for selection is prepared with supporting documentation for forwarding to the SSA.

The supporting documentation prepared for the selection decision shall show the relative differences among proposals and their strengths, weaknesses and risks in terms of the evaluation factors. The supporting documentation shall include the basis and reason for the decision. [Ref. 1:p. 15-23]

The SSA will review the SSEB proposal evaluations and the recommendations of the SSAC for completeness. After any additional questions have been answered or clarifications received, the SSA will make the source selection decision.

#### E. SOURCE SELECTION BID PROTEST FOR INADEQUATE COST REALISM

When the source selection decision has been made, the government has the responsibility to promptly notify each offeror whose proposal was not selected for award.

The notification shall include-

- (i) The number of offerors solicited
- (ii) The number of proposal received
- (iii) The name and address of each offeror receiving an award
- (iv) The items, quantities and unit prices of each award (if the number of items or other factors makes listing unit prices impracticable, only the total contract price need be furnished) and
- (v) In general terms, the reason the offeror's proposal was not accepted, unless the price information in (iv) above readily reveals the reason.[Ref.1:p. 15-42]

At this point, unsuccessful offerors have the right to protest the proposed contract award by filing a protest with the contracting officer or the Comptroller General. A belief that the government conducted inadequate cost

realism analysis is one reason of many possible reasons for filing such a protest.

Decisions by the Comptroller General in cost realism based bid protests have normally hinged on the informed judgement rule. The informed judgement rule is a requirement for the contracting officer to make an analysis of proposed costs that is sufficient for making a supportable judgement that the proposed costs are realistic.

If cost and technical analyses have been performed to the degree that a source selection decision can be made that is both reasonable and consistent with the evaluation factors contained in the solicitation, then the Comptroller General will most likely consider the decision an informed judgment.

Three points should be kept in mind. First, the informed judgment rule is a flexible not a fixed standard. What constitutes inadequate cost realism analysis in one set of circumstances may be adequate cost analysis in another....Second, the procuring agency's judgment as to the methods used in developing the government's cost estimate and the conclusions reached...are entitled to great weight since the procurement agencies are in the best position to determine the realism of costs....Third, a cost realism determination will be considered reasonable if it is based on an informed judgment that the proposed costs are realistic....An informed judgment results from consideration of a number of different factors, i.e. independent audits, government's statistics or similar contracts for similar services. By considering these and other factors, the Contracting Officer may develop and document the rational basis necessary for a cost realism determination that satisfies the informed judgment rule.  
[Ref. 5:p. 9]

## F. SUMMARY

This chapter discussed at when and where cost realism issues must be considered during the source selection process. First, planning for cost realism occurs when the source selection plan is prepared by determining those proposal evaluation factors which will be used. Second, the realism of proposed costs and technical performance are considered during the proposal evaluation process, whether or not a formal cost realism analysis takes place. Finally, the source selection decision is made based on a determination that the selected source is best able to meet the government's solicitation requirements, cost, technical and other factors considered. The possibility that a bid protest will be filed based on inadequate cost realism analysis always exists. However, the likelihood of an adverse Comptroller General decision is reduced as long as the source selection decision is a supportable judgment based on an adequate cost realism analysis.

#### IV. COST REALISM UTILIZATION IN THE DEPARTMENT OF THE NAVY

##### A. INTRODUCTION

This chapter reviews how cost realism is utilized in the Department of the Navy. The chapter begins with a discussion of cost realism requirements and guidance as established by the Office of the Assistant Secretary of the Navy, Shipbuilding and Logistics (ASN S&L). The chapter then introduces the cost realism practices of the Navy's three major system commands: Naval Sea Systems Command (NAVSEA), Naval Air Systems Command (NAVAIR) and the Space and Naval Warfare Systems Command (SPAWAR).

##### B. ASN (S&L) COST REALISM UTILIZATION

There was no formally established Navy-wide cost realism guidance in effect at the time of this study. The closest thing to Navy-wide guidance available is the Cost Realism Handbook for Assuring More Realistic Contractor Cost Proposals promulgated by the Navy Office for Acquisition Research:

The handbook is about source selection cost evaluation for competitive, cost reimbursable contracts with particular emphasis on assuring more realistic contractor cost proposals. It is intended as a practical guide and reference for program management personnel and source selection personnel.

The handbook discusses the source selection process and the necessity for adequate cost analysis to assure the



realism of contractor cost proposals. Techniques and procedures are presented for conducting cost realism analysis, but they are advisory only and not mandatory for source selection decisions.

The handbook goes into great detail on some of the different methods available for scoring cost realism. The thrust of the handbook's cost realism scoring methodology is the development of an unbiased scoring model against which all cost proposals can be compared with a clear winner emerging. Where the handbook appears to be incomplete is in its treatment of contractor cost proposals in comparison to the government's cost estimate. The difference between the contractor's cost proposal and the government's cost estimate determines the cost realism score with no allowance noted for positive or negative scores.

As an example of the handbook's proposed scoring method, a contractor proposal that is within plus or minus five percent of the government estimate could be awarded a maximum score. For a \$20 million government estimate, this would mean the contractor's proposal can be between \$19 and \$21 million. This presents a problem of contract award. If the government awards the contract for any amount less than the \$20 million government estimate, and the estimate was accurate, then there will most likely be a cost growth of \$1 million in contract completion costs. If the



contract is awarded for an amount greater than the government estimate, two questions arise. First, how can a fair and reasonable price determination be made at an amount higher than the government estimate? Second, assuming the contractor manages to the contract price, does the amount of the contract which exceeds the government estimate constitute additional profit and is this a violation of existing profit policy? [Ref. 6]

### C. NAVSEA COST REALISM UTILIZATION

#### 1. Introduction

NAVSEA uses cost realism analysis to assist the source selection decision making process in awarding cost reimbursable ship repair overhaul contracts. [Ref. 7]

NAVSEA obtains ship repair overhauls through what could best be described as a two step process. In the first step, potential offerors propose against a notional specification work package that represents NAVSEA's best estimate of the work effort which will be required during the ship repair overhaul. Contractor proposals are evaluated and scored in accordance with the evaluation factors contained in the RFP. Included among these evaluation factors are factors for cost realism and cost to government. After all proposals have been evaluated and scored, the winning offeror is chosen to receive the ship repair overhaul award. At this point, step two of the

process begins with finalization of the ship repair specification package and the commencement of negotiations (sole-source) for the terms, conditions and price for the actual ship repair overhaul contract. [Ref. 7]

## 2. Cost Realism Analyses Performed

NAVSEA's evaluation of a proposal begins with the selection of a sample of work items from the notional specification package for in depth evaluation. This selection of sample work items usually represents that ten percent of the work package items that have the highest value. [Ref. 7]

Evaluation of the selected work items is based upon the evaluator's review of the contractor's back-up data used to support the proposed material and manhours of labor to complete the work item. If the backup data fully supports the contractor's proposed material and labor figures in both quantity and quality, no adjustment to the proposal is necessary. If the backup data does not adequately support the contractor's proposed material or labor figures, the proposal is adjusted where required. The necessity for adjustment and the level of adjustment taken is a subjective determination made by the NAVSEA evaluator(s). [Ref. 7]

Evaluated and adjusted, if necessary, work item cost estimates are compared to the contractor's proposed work item estimate, and any difference becomes the

adjustment factor for that work item. The adjustment factors for all work items evaluated are then accumulated, and a cumulative adjustment factor is determined. The cumulative adjustment factor is then applied to the contractor's proposal resulting in an adjusted proposal, which also becomes the cost to government estimate. The percent difference between the original proposal and the adjusted proposal is used to score cost realism. [Ref. 7]

Cost to government scoring is based upon a ranking of all adjusted proposals, from lowest to highest. The proposal resulting in the lowest estimated cost to government receives the highest score with subsequent scores decreasing as cost to government increases. [Ref. 7]

Scores for cost realism and cost to government are weighted and combined with the weighted scores for other evaluation factors. The final scores for all offerors are then compared, and the highest scoring offeror is selected for contract award. [Ref.7]

#### D. NAVAIR COST REALISM UTILIZATION

##### 1. Introduction

NAVAIR uses cost realism analysis to assist the source selection decision making process in awarding cost reimbursable contracts. [Ref. 8]

## 2. Cost Realism Analysis Performed

NAVAIR's evaluation of contractor proposals results in a thorough, critical review of every proposal received in response to an RFP. [Ref. 8]

NAVAIR evaluators review each element of the WBS for completeness, adequacy and supportability. The determination of a contractor's capability to perform the effort contained in a proposal is made based upon a review of the proposal, prior performance of the contractor on similar efforts and, in some cases, prior performance of other contractors on similar efforts. The objective of NAVAIR's critical review is the development of an independent estimate of what the product will most probably cost the government if manufactured by the contractor. This most probable cost becomes the government estimate and when compared to the contractor's proposal forms the basis for a determination regarding the cost realism of the contractor's proposal. [Ref. 8]

The information developed regarding cost realism of the contractor's proposal is provided to the SSAC along with all other data generated during the proposal evaluation process. The SSAC, after considering evaluation reports on all offerors, makes an award recommendation to the SSA. [Ref. 8]

## E. SPAWAR COST REALISM UTILILZATION

### 1. Introduction

SPAWAR uses cost realism analysis to assist the source selection decision making process in awarding cost reimbursable contracts. [Ref. 9]

### 2. Cost Realism Analysis Performed

Among the Navy's three systems commands, SPAWAR alone has developed detailed procedures for the conduct of cost realism analysis on contractor proposals.

The procedure begins with the decision to include a requirement for cost realism analysis and scoring in the source selection plan. [Ref. 9] Contractors are advised in the RFP that cost realism analysis will be performed through the inclusion of the clause:

#### REALISM OF COST OR PRICE PROPOSALS (M-74 MAY)

An offeror's proposal is presumed to represent his best efforts to respond to the solicitation. Any inconsistency, whether real or apparent, between promised performance, and cost or price, should be explained in the proposal. For example, if the intended use of new and innovative production techniques is the basis for an abnormally low estimate, the nature of these techniques and their impact on cost or price should be explained; or, if a corporate policy decision has been made to absorb a portion of the estimated cost, that should be stated in the proposal. Any significant inconsistency, if unexplained, raises a fundamental issue of the offeror's understanding of the nature and scope of the work required and of his financial ability to perform the contract, and may be grounds for rejection of the proposal. The burden of proof as to cost credibility rests with the offeror.

Upon receipt of a contractor's proposal, a careful and complete evaluation of the proposal is made by the



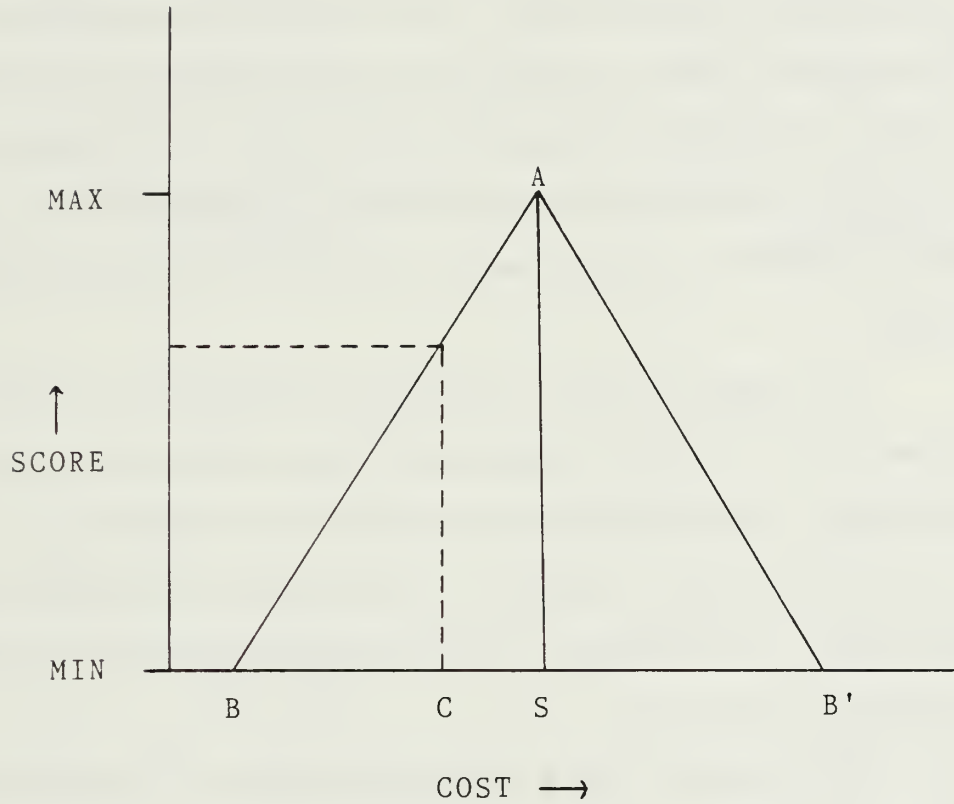
SPAWAR evaluation team. Each element of the WBS is examined for completeness, adequacy and supportability. Comparisons are made between the contractor's proposed costs for material, labor, overhead and known costs for similar efforts by this contractor, or other contractors on similar efforts. Adjustments are made to the contractor's proposal reflecting those changes the SPAWAR evaluators believe necessary to make the proposal more realistic. The adjusted proposal then becomes the SPAWAR estimate. The goal of the SPAWAR evaluation is to determine whether the contractor has the capability to perform the required effort and what the cost of this effort will be. [Ref. 10]

To score cost realism, the contractor's cost proposal and the SPAWAR cost estimate are plotted on the cost realism scoring rule table established for the procurement, and a score is awarded. The cost realism score becomes a part of the overall score for the proposal, as delineated in the source selection plan, and the proposal with the highest overall score is awarded the contract. [Ref. 10]

### 3. The SPAWAR Cost Realism Scoring Rule

As previously pointed out, the difference between the contractor's cost proposal and the SPAWAR cost estimate decides the cost realism score as determined by the cost realism scoring rule. The principle surrounding the cost realism scoring rule is very simple, as demonstrated in Figure 4.1. [Ref. 10]

## The SPAWAR Cost Realism Scoring Rule



Source: Adapted from [Ref. 10]

**Figure 4.1**

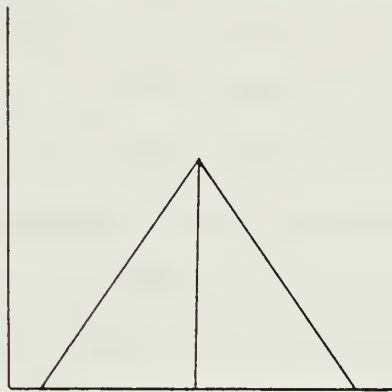
The SPAWAR cost estimate (S) determines the position on the graph where the maximum score can be earned. At predetermined distances from the SPAWAR cost estimate are the points B and B' where the minimum score will be earned. When the contractor's cost proposal (C) is plotted, the score associated with the difference (S-C) is determined by the line BAB'. The closer a contractor's cost proposal comes to equalling the SPAWAR cost estimate, the more the score approaches the maximum. The reverse is also true. As the contractor's cost proposal moves away from the SPAWAR cost estimate, the score approaches the minimum.

The shape of the line BAB' associated with the cost realism scoring rule is dependent upon the particular procurement under consideration and the assumptions associated with it. Figure 4.2 represents the more common shapes used consisting of the triangle, trapezoid, stepped and curve. [Ref. 10]

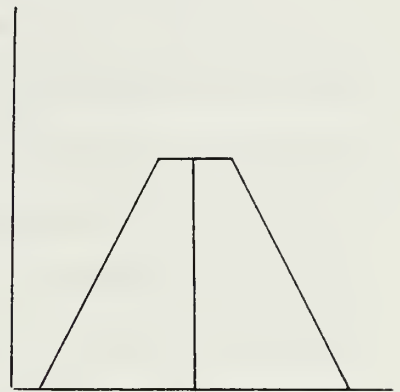
The triangle is a simple scoring rule to determine and plot. Between B or B' and S the score for C is proportional to the difference between S and C.

The trapezoid scoring rule allows a small cost range to define the SPAWAR cost estimate where different cost proposals can earn the maximum score. This scoring rule recognizes the uncertainty which can surround the

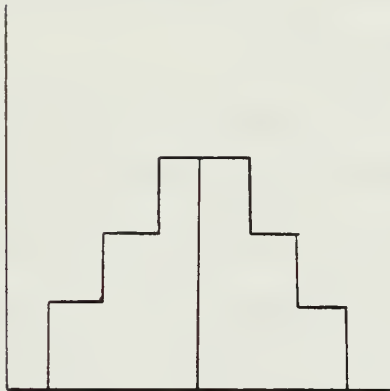
Common Cost Realism Scoring Rule Shapes



TRIANGLE



TRAPEZOID



STEPPED



CURVE

Source: Adapted from [Ref. 10]

**Figure 4.2**

development of the government's cost estimate and allows credit for this uncertainty.

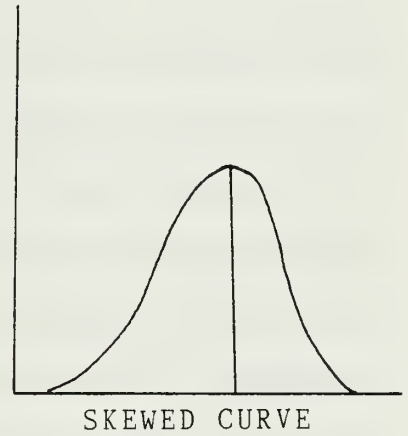
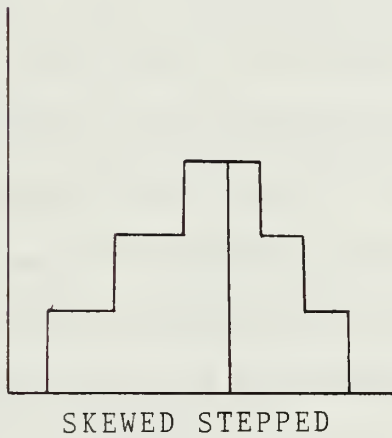
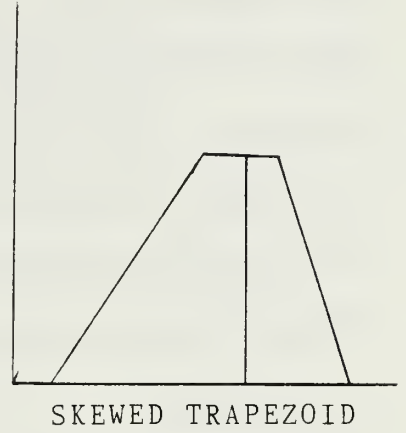
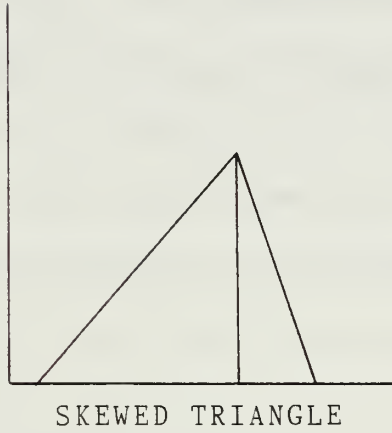
The stepped scoring rule takes the trapezoid one step further by assigning the same score to a range. The problems associated with this rule are twofold. First, the stepped scoring rule could assign quite different scores to two contractors whose cost proposals have similar degrees of cost realism (i.e. the two scores straddle a step break). Second, the stepped scoring rule could assign the same score to two contractors whose cost proposals have quite different degrees of cost realism (i.e. the two scores are at opposite ends of a step plateau).

The use of the curve scoring rule, such as the normal bell shaped curve, provides an approximation to the triangle and trapezoid scoring rules.

As previously stated, the type and shape of the cost realism scoring rule utilized in proposal evaluation is largely determined by the nature of the procurement. The scoring spread between the maximum score (S) and the minimum score (B or B') is usually around 20 percent. The belief is that any cost proposal that is more than 20 percent away from a carefully prepared SPAWAR estimate raises fundamental questions about the contractor's understanding of the contract requirements and hence the cost realism of the proposal [Ref. 10]. Of course, this is not to say that a scoring spread in excess of twenty



Skewed Cost Realism Scoring Rule Shapes



Source: Adapted from [Ref. 10]

**Figure 4.3**

percent cannot be established if the nature of the procurement requires it.

Another item considered while determining the type and shape of the cost realism scoring rule is the distribution of the scoring spread around the SPAWAR cost estimate. An even, symmetrical distribution is normally provided, but there can be procurements where the distribution is skewed as demonstrated in Figure 4.3.

[Ref. 10]

#### F. SUMMARY

The cost realism approaches taken by the three Navy systems commands appear very similar. First, each carefully evaluates contractor cost proposals for completeness, adequacy and supportability. Then, government cost estimates are developed using the contractor's proposal as a basis. Other data as considered desirable and necessary may be included. Finally, the contractor's cost proposal is compared to the government's cost estimate to determine the cost realism of the contractor's cost proposal. It is in the procedures for scoring cost realism that the three systems commands differ the most, with only SPAWAR having developed a rather formal and involved procedure. The end results for the three systems commands is the same, however, with the cost realism score being included as a part of the final score determination of a contractor's proposal.

## V. CONCLUSIONS AND RECOMMENDATIONS

### A. ANSWERS TO THE RESEARCH QUESTIONS

1. Can the cost realism concept be used to improve the source selection decision making process?

Cost realism requires a source selection decision to consider the most likely cost of a contractor's effort. The emphasis given to budgetary control issues makes it important that a source selection decision consider the most likely final cost of a procurement before making an award. With cost realism, the procurement program manager has a good prediction of what the budgetary requirements for the program will be.

2. What is cost realism?

Cost realism is the methodology by which a contractor's cost proposal is evaluated during the source selection process to determine, with some degree of accuracy and fairness, whether or not it is a realistic estimate of the actual costs, assuming no changes to the government's requirements or the contractor's elements of cost and/or technical approach.

3. At what points and under what circumstances may cost realism become an issue in the source selection process?

First, during the development of the source selection plan when planning for cost realism is first considered.

The cost realism methodology to be employed must be capable of giving adequate consideration to the various risks associated with the procurement while providing a realistic estimate of the procurement's actual costs. Second, how cost realism will be weighted and scored in the source selection plan may become an issue dependent upon the other requirements of the procurement and the capabilities of the potential offerors. As competing proposals are evaluated and considered essentially equal in the other evaluation factors, (i.e. technical, management, schedule, cost), cost realism may become the determining factor. An inadequate cost realism analysis could result in award to an offeror whose proposal is not the most advantageous to the government and the protest of that award by the unsuccessful offeror(s).

4. How can cost realism best be utilized in the source selection process?

Cost realism can best be utilized as an evaluation factor by the SSA in making the source selection decision. While performing a cost realism analysis the contractor's proposal receives a detailed evaluation that provides an estimate of the most likely cost of the contractor's proposal. The cost realism score provides an invaluable method to compare different proposals and also provides a solid basis upon which to defend a source selection decision if that should become necessary.

## B. CONCLUSIONS

The following conclusions were developed as a result of this research effort.

Cost realism analysis when adequately performed may assist the Source Selection Authority in making an informed judgement source selection decision.

As discussed, cost realism can be one of many evaluation factors considered by the SSA in making a source selection decision. As competing proposals become more equal in non-cost related evaluation factors (i.e. technical, management, schedule), the cost related evaluation factors increase in importance as potentially deciding factors. The necessity for an informed judgement with regard to the cost related evaluation factors increases the probability that a source selection decision will be supportable and defensible.

An adequate cost realism analysis requires a thorough and complete review of all aspects of a contractor's proposal to develop a costing baseline for the government estimate.

It is in comparison against the evaluated government estimate that the cost realism of a contractor's proposal is determined. The government estimate is developed through a careful and complete evaluation of the elements of cost (material, labor, overhead), which make up the contractor's cost proposal.



Cost realism is an excellent forecaster of what a program will most likely cost; however, cost realism is not a guarantee of what the program's final cost will be.

The government estimate of a contractor's most likely cost is still just an estimate. It is subject to the risks inherent to most cost reimbursable procurements: schedule, risk, design risk and production risk. If all risk could be eliminated from a program, there would be no need for a cost reimbursable contract award. Bids could be taken from potential offerors, and the award would be made to the lowest cost bidder. Since risk exists, there is the distinct possibility that a program will experience cost growth changes to the estimated final cost.

#### C. RECOMMENDATIONS

The following recommendations are relevant from this research effort.

A standard methodology for determining the cost realism of a contractor's proposal should be established and required for all cost reimbursable contract awards.

The FAR and service implementing directives and instructions should be revised to give specific guidance on determining the cost realism of a contractor's proposal. Developing standards for cost realism analysis and requiring a cost realism determination for contractor proposals will ensure that source selection decisions are informed judgments.

Cost realism should be used for any procurement where the contractor is required to provide cost and pricing data.

Sole source negotiations for a cost reimbursable contract could use cost realism analysis to assist in determining a fair and reasonable price for the procurement.

#### D. RECOMMENDATIONS FOR FURTHER RESEARCH

A study should be conducted to evaluate the optimum characteristics of cost realism scoring rules and the differing procurement circumstances under which their use can be maximized.

A study should be conducted to determine how cost realism is evaluated in other government agencies.

A study should be conducted to review the effect cost realism has on how contractors develop and present competitive cost proposals.

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